

# Operating/Service Instructions

## ROTARY MOWER

MODEL NO.  
113-530 A

### IMPORTANT

## SAFE OPERATION PRACTICES FOR WALK-BEHIND MOWERS

### TRAINING

1. Read the Operating and Service Instruction Manual carefully. Be thoroughly familiar with the controls and the proper use of the equipment.
2. Never allow children to operate a power mower.
3. Keep the area of operation clear of all persons, particularly small children, and pets.
5. If the equipment should start to vibrate abnormally, stop the engine (motor) and check immediately for the cause. Vibration is generally a warning of trouble.
6. Stop the engine (motor) whenever you leave the equipment, before cleaning the mower housing, and when making any repairs or inspections.

### PREPARATION

1. Thoroughly inspect the area where the equipment is to be used and remove all stones, sticks, wire, bones and other foreign objects.
2. Do not operate equipment when barefoot or wearing open sandals. Always wear substantial footwear.
3. Check the fuel before starting the engine. Do not fill the gasoline tank indoors, when the engine is running, or while the engine is still hot. Wipe off any spilled gasoline before starting the engine.
4. Disengage the self-propelled mechanism or drive clutch on units so equipped before starting the engine (motor).
5. Never attempt to make a wheel adjustment while the engine (motor) is running.
6. Mow only in daylight or in good artificial light.
7. Never operate the equipment in wet grass. Always be sure of your footing; keep a firm hold on the handle and walk, never run.
7. When cleaning, repairing or inspecting, make certain the blade and all moving parts have stopped. Disconnect the spark plug wire, and keep the wire away from the plug to prevent accidental starting.
8. Do not run the engine indoors.
9. Shut the engine (motor) off and wait until the blade comes to a complete stop before removing the grass catcher or unclogging chute.
10. Mow across the face of slopes, never up-and-down. Exercise extreme caution when changing direction on slopes. Do not mow excessively steep slopes.
11. Always disconnect electric mowers (line operated) before cleaning, repairing or adjusting.
12. Never operate mower without proper guards, plates or other safety protective devices in place.
13. Keep washout ports and other mower-housing service openings closed when mowing.

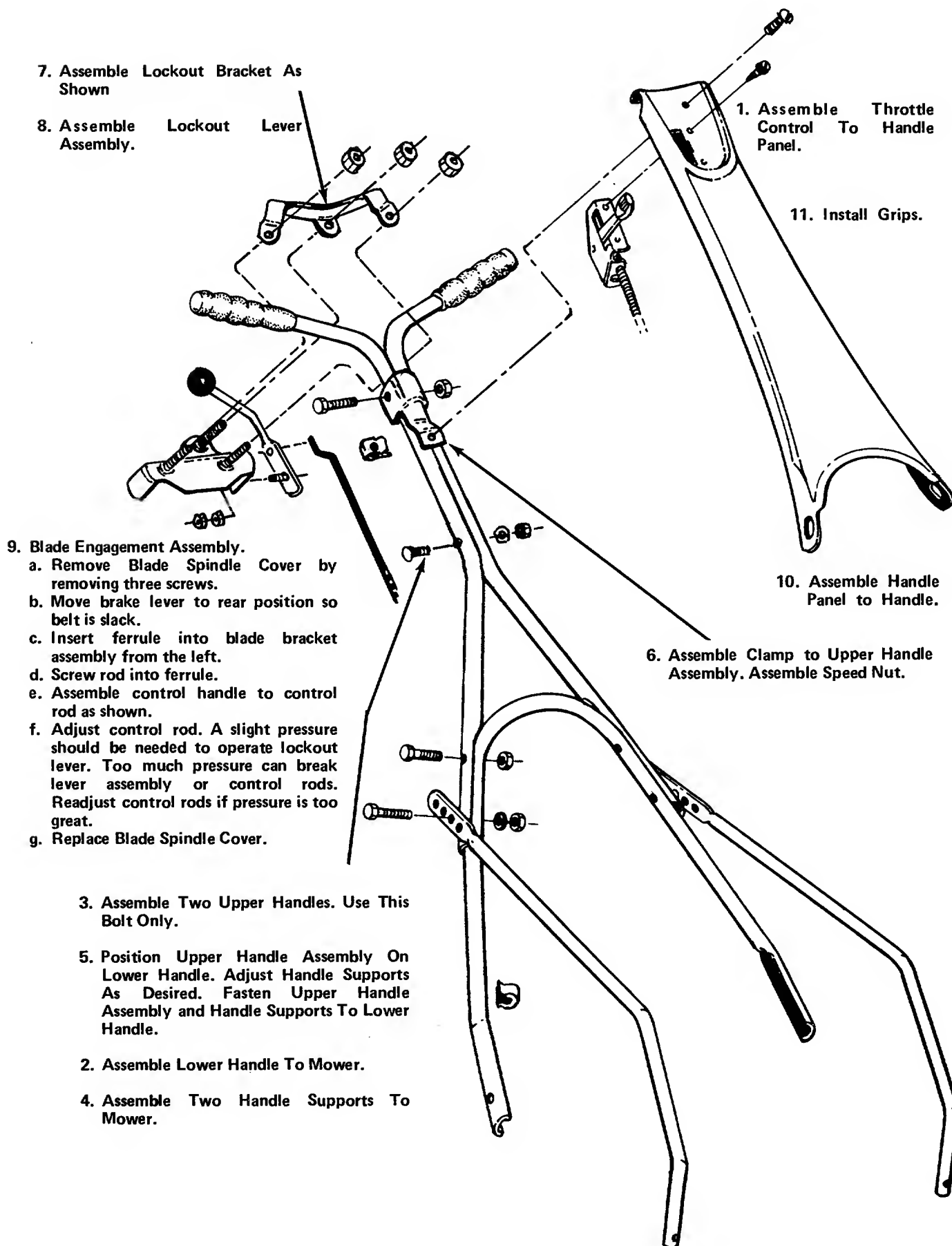
### OPERATION

1. Do not change the engine governor settings or overspeed the engine.
2. Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times.
3. Stop the blade(s) when crossing gravel drive, walks or roads.
4. After striking a foreign object, stop the engine (motor), remove the wire from spark plug, thoroughly inspect the mower for any damage, and repair the damage before restarting and operating the mower.

### MAINTENANCE AND STORAGE

1. Check the blade and the engine mounting bolts at frequent intervals for proper tightness.
2. Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.
3. Never store the equipment with gasoline in the tank inside of a building where fumes may reach an open flame or spark. Allow the engine to cool before storing in any enclosure.
4. To reduce fire hazard, keep the engine free of grass, leaves, or excessive grease.
5. Check the grass catcher bags frequently for wear or deterioration. Replace with new bags for safety protection.

**Note: Follow Assembly Instructions In Numerical Order!**

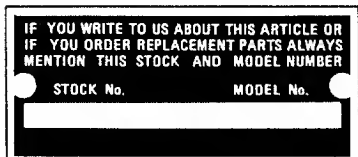
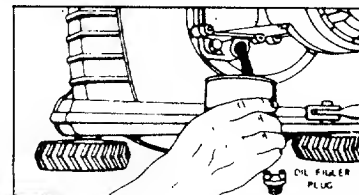


# 113-530 A

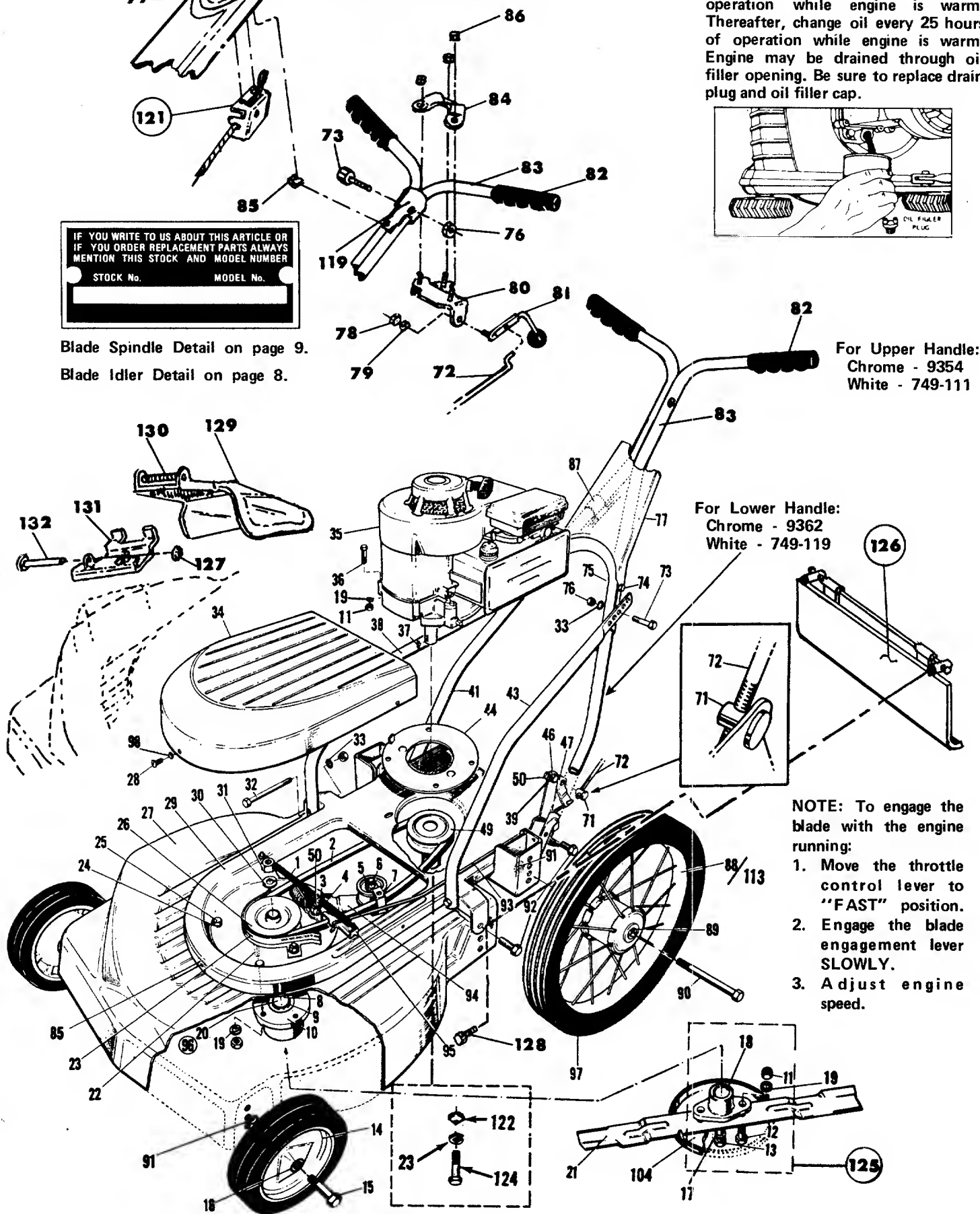
NOTE: Set screws in pulleys are treated with a nut and bolt sealant. Remove with Allen wrench while applying heat with a small torch. Sealant disintegrates at 400°.

## 4-CYCLE ENGINE

Change oil after first 5 hours of operation while engine is warm. Thereafter, change oil every 25 hours of operation while engine is warm. Engine may be drained through oil filler opening. Be sure to replace drain plug and oil filler cap.



Blade Spindle Detail on page 9.  
Blade Idler Detail on page 8.



For Upper Handle:  
Chrome - 9354  
White - 749-111

For Lower Handle:  
Chrome - 9362  
White - 749-119

NOTE: To engage the blade with the engine running:

1. Move the throttle control lever to "FAST" position.
2. Engage the blade engagement lever SLOWLY.
3. Adjust engine speed.

# PARTS LIST FOR ROTARY MOWER MODEL NO. 113-530 A

REF. NO.	PART NO.	COLOR CODE	DESCRIPTION	NEW PART
1	732-158		Blade Tension Spring	
2	754-109		V Belt - 1/2 x 43 *	
3	736-300		Flat Washer - 3/8 I.D.	
4	710-373		Shoulder - Special	
5	756-370		Idler Bearing Assembly	
6	712-372		Centerlock - Hex Nut - 5/16-18" Thd. *	
7	7353		Bracket - Belt	
8	711-212		Sleeve	
9	741-120		Bearing - Upper	
10	719-120		Spindle Housing	
11	712-123		Hex Nut - 5/16-24 Thd. * †	
12	710-117		Hex Hd. Cap Scr. - 5/16-24 x 1" lg. (Heat Treated)	
13	710-459		Hex Hd. Cap Scr. 3/8-24 x 1-1/2" lg. (Heat Treated)	
14	9383-513		Wheel Assembly - 8" - B.B. (Front)	
15	738-213		Axle Bolt - 5/8 length Thd. (Front)	
16	741-114		Ball Bearing (Front)	
17	736-217		Spring Lockwasher 3/8 Heavy Duty Scr. *	
18	10769		Blade Adapter Kit	
19	736-119		Spring Lockwasher - 5/16 Scr. *	
20	711-240		Spindle	
21	742-125		Blade - 20"	
22	710-122		Hex Hd. Cap Scr. 5/16-24 x 1" lg. *	
23	8324		Belt Guard	
24	712-123		Hex Nut 5/16-24" Thd. *	
25	710-122		Hex Hd. Cap Scr. 5/16-24 x 1" lg. *	
26	9925		Pulley - 4"	
27	11650-458		Deck Assembly - 22"	
28	710-192		Truss Mach. Scr. No. 10-24 x .38" lg.	
29	8280-458		Frame Assembly	
30	736-921		Spring Lockwasher - 1/2" Scr. *	
31	712-922		Hex Jam Nut - 1/2-20 Thd. *	
32	710-102		Hex Hd. Cap Scr. 1/4-20 x 2-1/2 lg. *	
33	736-222		Ext. Lockwasher - 1/4 Scr. *	
34	8295-458		Blade Spindle Cover	
35	-----		Engine	
36	710-158		Hex Hd. Cap Scr. 5/16-24 x 1-1/4" lg. *	
37	714-365		Key - Hi Pro No. 505 * †	
38	8328		Handle Support - Lower R.H.	
39	736-108		Flat Washer - 33/64 I.D. *	
41	9362		Handle - Lower H. W.	
43	8327		Handle Support - Lower L.H.	
44	8325		Belt Trap Assembly	
46	738-234		Pivot Screw	
47	9372		Pivot Bracket	
49	756-110		Engine Pulley	
50	712-430		Elastic Stop Nut - 3/8-16 Thd. *	
51	8809		Reinforcement Plate	
71	711-179		Ferrule	
72	711-180		Control Rod	
73	710-606		Hex Hd. Cap Scr. 1/4-20 x 1-1/2" lg. *	
74	710-106		Hex Hd. Cap Scr. 1/4-20 x 1-1/4" lg. *	
75	712-287		Hex Nut - 1/2-20 Thd.	
76	712-107		Centerlock - Hex Nut - 1/4-20" Thd. *	
77	11815-458		Control Panel	
78	712-324		Elastic Stop Nut - 1/4-20 Thd.	
79	736-325		Flat Washer - .265 I.D. *	

# **PARTS LIST FOR ROTARY MOWER MODEL NO. 113-530 A**

REF. NO.	PART NO.	COLOR CODE	DESCRIPTION	NEW PART
80	8376		Lockout Bracket Ass'y.	N
81	8373		Lockout Lever Ass'y.	
82	720-157		Grip	
83	9354		Handle - Upper	
84	8378		Clamp Bracket	
85	712-526		Speed Nut - 10-24 Thd. *	
87	746-128		Cable Clip	
88	734-180		Wheel Assembly - 16" less Tire (Rear)	
89	741-113		Ball Bearing (Rear)	
90	734		Axle Bolt (Rear)	
91	736-105		Belleville Washer	
92	710-209		Sems Hex Hd. Cap Scr. 3/8-16 x 5/8" lg. *	
93	9373		Control Rod	
94	8298		Idler Bracket Assembly	
95	9371		Brake Lever	
96	7805		Blade Spindle Ass'y. - complete H.W.	
97	734-392		Tire - Rib Tread 16 x 1.75	
98	736-147		External Lockwasher No. 10 Scr.	
104	7919		Anti Scalp Plate - 8-1/2"	
110	710-938		Allen Set Scr. - 1/4-28 x 1/4" lg. * (not shown)	
111	741-107		Bearing - Lower - Blade Spindle	
113	734-439		Wheel Ass'y. - complete (rear)	
114	736-154		Washer	
115	721-105		Seal	
116	737-479		Zerk Fitting	
117	728-649		Rivet	
118	754-647		Brake Shoe	
119	7861		Clamp Bracket	
120	710-407		Slot Hex Hd. Self Extr. Scr. No. 8-32 x .50" lg.	
121	746-171		Throttle Control - complete	
122	736-112		Belleville Washer	
123	736-169		Lockwasher 3/8 Scr. *	
124	710-152		Hex Hd. Cap Scr. 3/8-24 x 1" lg. *	
	718-132		Plastic Cap - rear wheel (not shown)	
125	10769		Blade Adapter Kit	
126	11193-458		Rear Protective Shield Assembly - complete	
127	726-106		Push-on Flange Palnut	
128	11145		Hinge Rod	
129	11141-458		Chute Deflector	
130	732-253		Torsion Spring	
131	11131-458		Adapter Plate	
132	711-555		Pivot Pin	
	11679-458		Chute Deflector Ass'y. - complete (Includes Ref. No. 127, 129, 130, 131, 132)	N

\*For faster service, obtain standard nuts, bolts, and washers locally. If these items cannot be obtained locally, order by part number and size as shown on parts list.

(458 - Arctic Blue) - When ordering parts if color or finish is important, use the appropriate color code shown at left. (e.g. Arctic Blue - 11650 (458) ).

The engine is not under warranty by the mower manufacturer. If repairs or service is needed on the engine, please contact your nearest authorized engine service outlet. Check the "Yellow Pages" of your telephone book under "Engines-Gasoline."

Find us fast in the



## OPERATION

1. Before starting engine, check LUBRICATION INSTRUCTIONS.
2. Check lockout control handle for proper operation. If too great a pressure is needed to operate these controls, damage can be done to both the mechanism and the rods. Readjust so only slight pressure is needed to operate the blade engaging control. See ASSEMBLY INSTRUCTIONS Step 9.
3. Service engine with gasoline and oil. See engine instructions for complete care and maintenance of engine. READ DIRECTIONS CAREFULLY.
4. Be sure engine crankcase is filled to capacity with proper grade of oil.
5. Move control handle to "OFF" position.
6. Move throttle control lever to "Choke" position.
7. Crank engine. Move throttle control lever to "Fast" position as soon as engine fires. Use choke as needed to keep engine running during warm up period.
8. Put blade into motion by moving blade control handle to "On" position.

To engage the blade with the engine running . . .

- a. Move the throttle control lever to "Fast" position.
  - b. Engage the blade engagement handle SLOWLY.
  - c. Adjust engine speed.
9. A brief break-in period is essential to insure maximum engine and mower life. This consists of running the engine at half speed for a period of time required to use one tank of gasoline. It is also recommended to change crankcase oil after the first five hours of operation or as operating conditions dictate. Always check oil before operating the mower. BE SURE CRANKCASE IS FULL.
  10. Proper lubrication must be maintained at all times.
  11. Appropriate clothing should be worn when cutting brush or heavy weeds. Safety shoes and safety glasses are highly recommended.
  12. The engine is stopped by moving the throttle control lever to "STOP" position.

## ADJUSTMENT

1. Handles may be adjusted by changing the position of the lower support mounting holes. When this change is made, it may also be necessary to check the adjustment of the control rod. See Step 9 in ASSEMBLY INSTRUCTIONS.
2. Control rod adjustment is made as shown in ASSEMBLY INSTRUCTIONS Step 9.
3. Cutting height adjustment is made by removing and moving axle bolts to the desired positions. All axle bolts must be mounted in the same relative position to the deck. When wheels are mounted to the deck, the **crown shape washers must be assembled with the crown away from the deck.** This is necessary to prevent the axle bolts from loosening.
4. If throttle adjustment becomes necessary, the throttle control wire may be reset as follows:
  - a. Loosen, but do not remove, screw securing throttle control wire assembly at engine.
  - b. Move throttle control lever on handle to "Choke" position.
  - c. Move lever to which control wire is fastened to engine to full choke position. Retighten screw to secure throttle control wire assembly.

## LUBRICATION

**Important:** Always stop engine and disconnect spark plug wire before cleaning, lubricating or doing any kind of work on the lawn mower.

1. Wheel bearings are ball bearings. Use SAE 30 engine oil.
2. Throttle — Periodically lubricate throttle control lever and entire length of throttle wire assembly with a few drops of SAE 30 engine oil for ease of operation.
3. Engine — Follow engine manual for lubrication instructions. Check oil level before each mowing.
4. Friction point between idler bracket assembly (Ref. No. 94) and deck should be greased once each season with a multi-purpose grease.
5. Blade Spindle Assembly — The blade spindle assembly is equipped with a grease fitting. Use grass discharge chute for access to the fitting located under the deck. Use multi-purpose grease. Lubricate PRIOR to initial use and every 25 hours thereafter. CAUTION: Be sure spark plug wire is disconnected and grounded.

6. Protective Shield — The pivot points on the protective shield should be lubricated periodically with oil to prevent any rust or binding up.
7. Chute Deflector — The torsion spring and pivot point should be lubricated periodically with oil to prevent any rust or binding up. Deflector must work freely.

## **MAINTENANCE**

**Important:** Always stop engine and disconnect spark plug wire before cleaning, lubricating or doing any kind of work on the lawn mower.

1. Cutting Blade — Remove all nuts and bolts holding the blade to the blade hub.

When sharpening blade, follow the original angle of grind as a guide. It is extremely important that each cutting edge receives an equal amount of grinding to prevent an unbalanced blade. An unbalanced blade will cause excessive vibration when rotating at high speeds and may cause damage to the mower.

Upon reassembling, make certain all parts are assembled properly and tightened securely.

2. Deck — The underside of mower deck should be cleaned after each period of use as grass clippings, leaves, dirt and other matter accumulates. This accumulation of grass clippings, etc. is undesirable as it will invite rust and corrosion and may cause an uneven discharge of grass clippings at next cutting.

The deck may be cleaned by tilting the mower backward or on its side and scraping clean with a suitable tool or by washing with a stream of water from a garden hose. **CAUTION:** Do not direct the stream of water at a hot engine as damage to the engine may result.

3. Belt replacement may be made as follows:
  - a. Remove blade spindle cover.
  - b. Remove front belt guard.
  - c. Remove blade tension spring.
  - d. Loosen belt on bracket of idler bearing assembly.
  - e. Remove brake lever assembly.
  - f. Remove damaged or worn belt.
  - g. Place new belt on engine pulley. Do not bend belt guard pins. Belt should be inside of pins.

- h. Work belt to front and mount on blade spindle pulley. Replace front belt guard.
- i. Replace brake lever assembly.
- j. Slip belt on idler pulley between pulley and belt bracket.
- k. Replace blade tension spring.
- l. Move blade lockout handle to "ON" position.
- m. Position belt bracket on idler pulley to clear the tightened belt. Secure belt bracket in position. See drawing page 2.
- n. Replace blade spindle cover.

4. Storage — The following steps should be taken to prepare lawn mower for storage:
  - a. Clean and lubricate mower thoroughly as described in the preceding instructions.
  - b. Refer to engine manual for correct engine storage instructions.
  - c. Coat mower's cutting blade with multi-purpose grease to prevent rusting.
  - d. Place blocks under deck to raise tires clear of floor.
  - e. Store mower in a dry, clean area.

## **USING YOUR ROTARY MOWER**

For best results do not cut wet grass because it tends to stick to the underside of the mower, thus preventing proper discharge of grass clippings. If wet grass must be cut, reduce walking speed to help distribute the clippings more effectively.

New grass should be treated as wet grass, otherwise a normal walking speed is about the right pace for efficient mowing.

The best mowing pattern is one that allows the clippings to discharge towards the uncut part of the lawn. This permits recutting of the clippings to further pulverize them. When cutting high weeds, discharge towards cut portion then recut at right angle to first direction.

Lawns should be cut in fall as long as there is growth.

## BLADE IDLER BRACKET ASSEMBLY DETAIL

BRAKE SHOE 754-647 (118)

RIVET 728-649 (117)

IDLER BRACKET ASSEMBLY (94)  
8298

IDLER BEARING (5)  
756-370

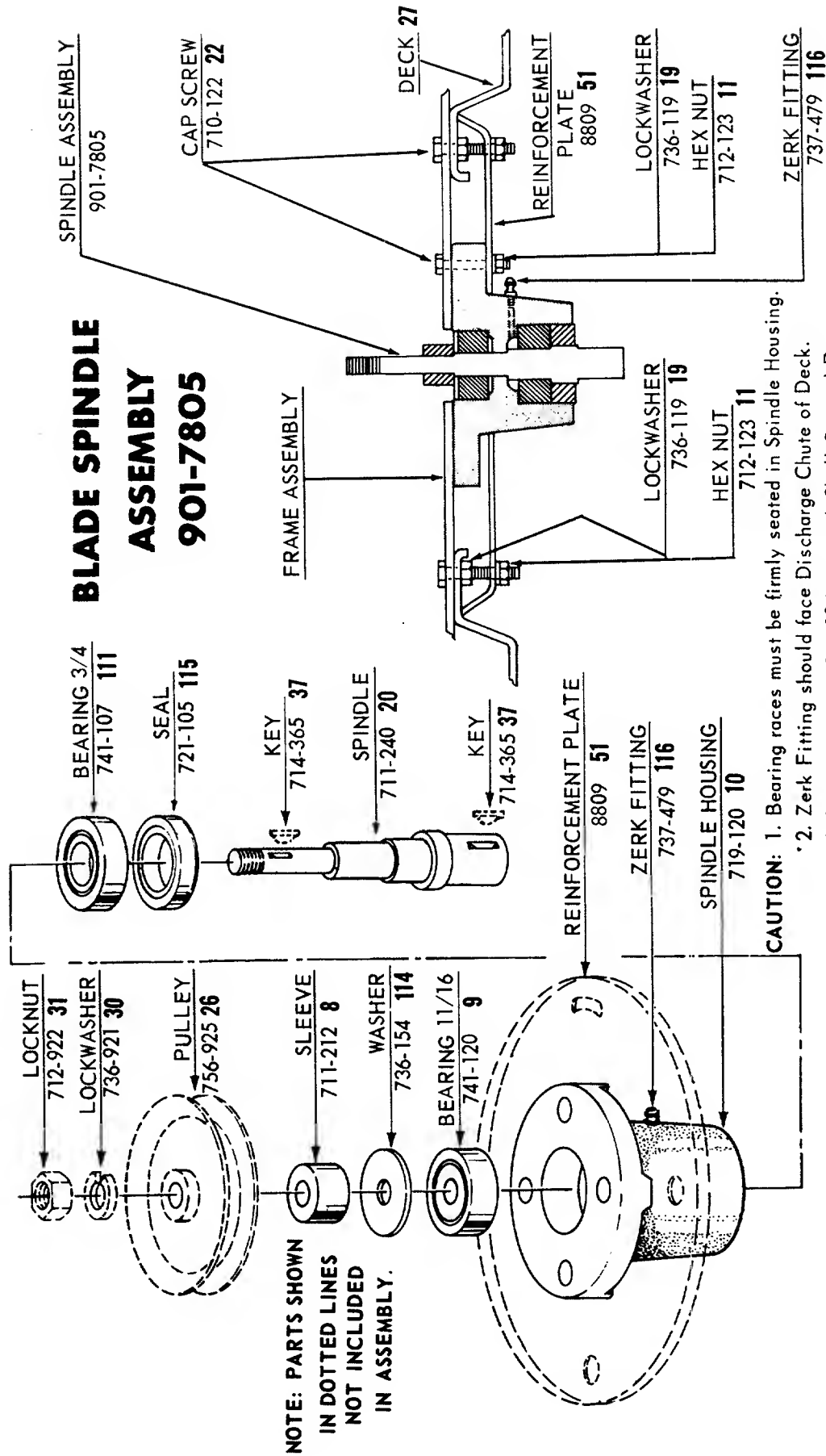
HEX LOCK NUT (6)  
712-372

BELT CLIP (7)  
7353

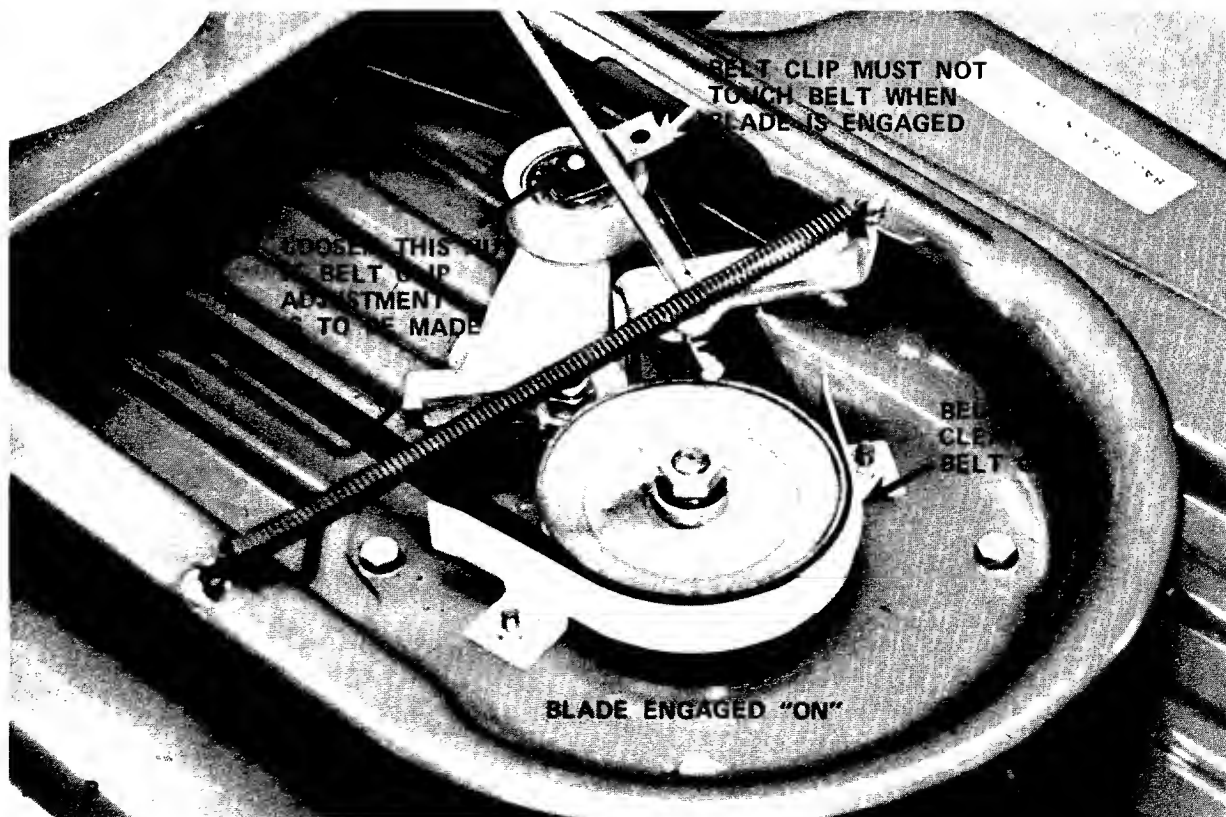
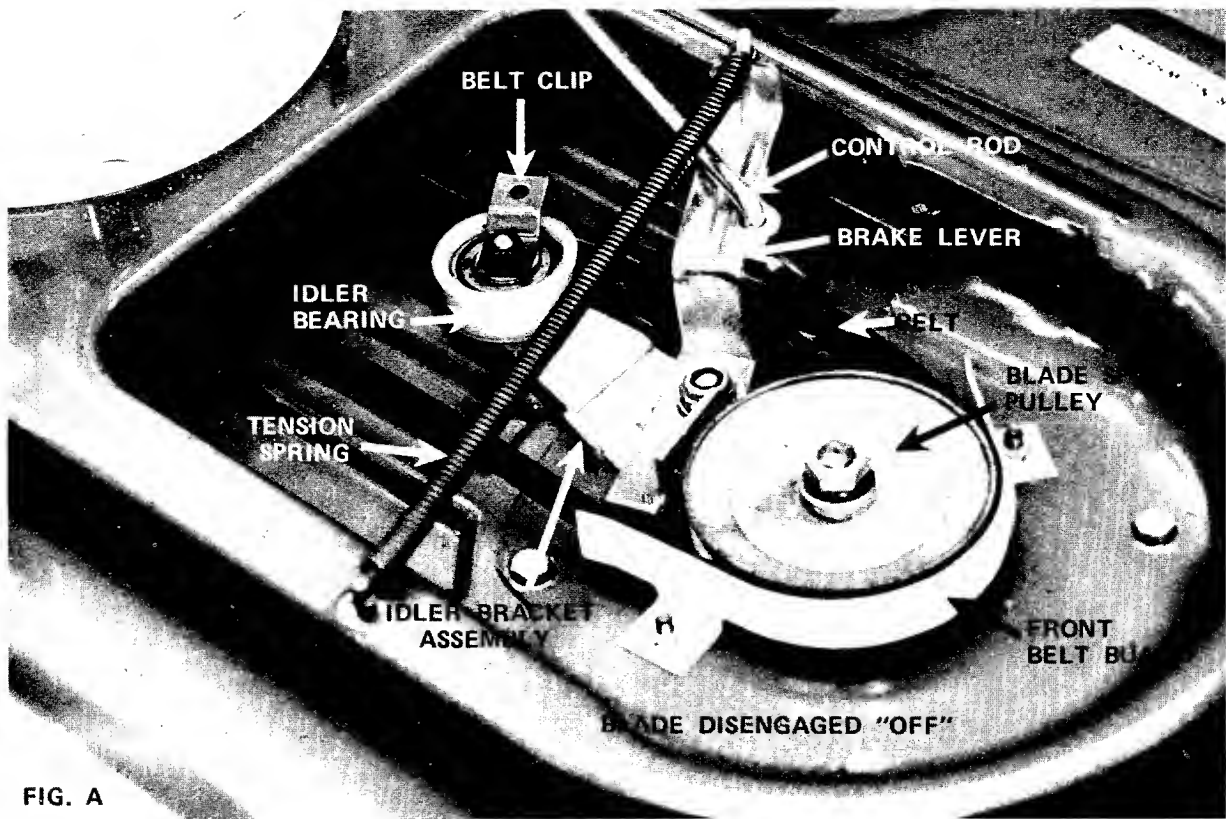
### BELT WEAR

Belt clips improperly positioned will cause premature belt wear. The belt clip must **completely clear the belt** when the belt is tightened. It should also assist in freeing the belt from the blade spindle pulley when the belt is loose. This may be checked by removing the blade spindle cover.





**CAUTION:** 1. Bearing races must be firmly seated in Spindle Housing.  
 2. Zerk Fitting should face Discharge Chute of Deck.  
 3. Lubricate every 8 to 10 hours with Shell General Purpose Grease or Equivalent.



GRASS CATCHER Model No. 193-003 is available as optional equipment for the mowers shown in this manual.

**WARNING:**

1. The mower should not be operated without the entire grass catcher or chute deflector in place.
2. The mower should not be operated without the protective shield on the rear of the deck in place.

**NOTE:**

Under normal usage bag material is subject to wear and should be checked periodically. Be sure any replacement bag complies with the mower manufacturer's recommendations.

For replacement bags, use only factory authorized replacement bag No. 764-119.

**★ IMPORTANT**

After striking a foreign object, stop the engine (motor), remove wire from spark plug. Thoroughly inspect the mower for any damage, and repair the damage before restarting and operating the mower.

**WARRANTY**

For one year from date of purchase, MTD Products Inc will replace for the original purchaser, free of charge, F.O.B. factory or authorized service firm, any part or parts found to be defective in material or workmanship. All transportation charges on parts submitted for replacement under this warranty must be paid by the purchaser. This warranty does not include replacement of parts which become inoperative through misuse, excessive use, accident, neglect, improper maintenance or alterations by unauthorized persons. This warranty does not include the engine, motor, battery, battery charger or any component parts thereof. For service on these units, refer to the applicable manufacturer's warranty.

The above warranty will apply only to the original owner and will be effective only if the warranty card has been properly processed. It will not apply where the unit has been used commercially.

Warranty service is available through your local authorized service dealer or distributor. **UNDER NO CIRCUMSTANCES WILL THE RETURN OF A COMPLETE UNIT BE ACCEPTED BY THE FACTORY UNLESS PRIOR WRITTEN PERMISSION HAS BEEN EXTENDED.**

# PARTS INFORMATION

**DEFECTIVE OR MISSING PARTS** must be reported to the factory immediately. Such claims must include your model number and date of purchase.

## MOWER, TILLER, SNOW THROWER, TRACTOR, TRAIL BIKE AND MUD BUG PARTS

Mower, tiller, snow thrower, tractor, trail bike and mud bug parts are available through the authorized service firms listed below. All orders should specify the model number of your unit, parts numbers, de-

scription of parts and the quantity of each part required.

## BRIGGS & STRATTON, TECUMSEH AND PEERLESS PARTS AND SERVICE

Briggs & Stratton, Tecumseh and Peerless parts and service should be handled by your nearest authorized engine service firm. Check the yellow pages of your telephone directory under the listing *Engines — Gasoline*, Briggs & Stratton or Tecumseh Lauson — Power Products.

### A 1 Engine & Mower Co.

327 East 9th Street  
Salt Lake City, Utah 84102

### American Electric Ignition Co.

124 N. W. 8th Street  
Oklahoma City, Oklahoma 73102

### Auto Electric & Carburetor Co.

2625 4th Avenue, S.  
P. O. Box 1948  
Birmingham, Alabama 35233

### Automotive Equipment Service Co.

3117 Holmes Street  
Kansas City, Missouri 64109

### Bailey's Rebuild Inc.

1325 E. Madison Street  
Seattle, Washington 98102

### Brown Equipment Distributor Inc.

110 Beech Street  
Corydon, Indiana 47112

### Bullard Supply

2409 Commerce Street  
Houston, Texas 77003

### Catto & Putty, Inc.

P. O. Box 2408  
510 Soledad Street  
San Antonio, Texas 78205

### Center Supply Company

6867 New Hampshire Avenue  
Takoma Park, Maryland 20012

### Charles B. Wright Co.

309 4th Avenue, South  
Nashville, Tennessee 37201

### W. B. Clements

400 Salem Avenue  
Roanoke, Virginia 24016

### Morton B. Collins Co.

300 Birnie Avenue  
Springfield, Massachusetts 01107

### Dixie Sales Company

P. O. Box 1408  
327 Battleground Avenue  
Greensboro, North Carolina 27402

### East Point Cycle & Key Shop

1617 Whiteway  
East Point, Georgia 30044

### Gamble Distributors

West End Avenue  
Carthage, New York 13619

### Garden Equipment Co., Inc.

6600 Cherry Avenue  
Long Beach, California 90805

### Henzler, Inc.

2015 Lemay Ferry Road  
St. Louis, Missouri 63125

### Frank E. Ives & Son

1101 Lincoln Avenue  
Prospect Park, Pennsylvania 19076

### J. W. Jewett Co.

981 Folsom Street  
San Francisco, California 94107

### Kenton Supply

8216 North Denver Avenue  
Portland, Oregon 97217

### Kimber's Inc.

115 W. Geddes St.  
Syracuse, New York 13204

### The Lawnmower Shop

1340 El Camino Real  
San Carlos, California 94070

### Marr Brothers

423 E. Jefferson  
Dallas, Texas 75203

### Mathews Auto Electric Co.

420 East 2nd Street  
Tulsa, Oklahoma 74120

### McClure Lawn & Garden Supply

1114 Lexington Avenue  
Mansfield, Ohio 44907

### Memphis Cycle & Supply Co.

421 Monroe Avenue  
Memphis Tennessee 38103

### Moz-All of Florida, Inc.

365 Greco Avenue  
Coral Gables, Florida 33146

### National Central, Div. of

Joe Sterling, Inc.  
Drawer "D" 687 Seville Rd.  
Wadsworth, Ohio 44281

### Power Equipment Distributor

36463 So. Gratiot Avenue  
Mt. Clemens, Michigan 48043

### Parts & Sales Inc.

2101 Industrial Pkwy.  
Elkhart, Indiana 46514

### Parts & Sales Inc.

335 West St. Charles Road  
Villa Park, Illinois 60181

### Power Lawn & Garden Equip. Co.

2551-2571 J. F. Kennedy Road  
Dubuque, Iowa 52001

### Raub Supply Company

James & Mulberry Sts.  
Lancaster, Pennsylvania 17604

### Radco Distributors

2403 Market Street  
P. O. Box 3216  
Jacksonville, Florida 32206

### Richmond Battery & Ignition

P. O. Box 25369 — 957 Myers St.  
Richmond, Virginia 23260

### Smith Hardware Company

515 N. George Street  
Goldsboro, North Carolina 27530

### South Denver Lawn Equip. Co.

527 West Evans  
Denver, Colorado 80223

### Suhren Engine

8330 Earhart Blvd.  
New Orleans, Louisiana 70118

### Sutton's Lawn Mower Shop

Route 4, Box 343  
North Little Rock, Arkansas 72117

### Warner Equipment

7520 Lyndale Avenue, So.  
Minneapolis, Minnesota 55423

## WARRANTY PARTS AND SERVICE POLICY

The purpose of warranty is to protect the customer from defects in material and workmanship, defects which are not detected at the time of manufacture.

Our aim is to build into our product quality and reliability. Considerable emphasis is placed on quality control in order to assure our customer of satisfactory product performance. To achieve this goal, it is necessary to gain the cooperation of all concerned, MTD, our sales force and our customers.

MTD's responsibility is to build a quality product and to back up that product. MTD must build this quality product at a competitive price. This cannot be achieved without production in quantity. Quantity production is mass production. In mass production it is always possible for undetected defects to be present when the product reaches the customer. Our warranty is extended to assure the customer that any such defects will be corrected.

Use and maintenance are the responsibility of the customer. MTD cannot assume responsibility for conditions over which it has no control. MTD's responsibility does not cover misuse, excessive use, accident neglect, improper maintenance or alterations by unauthorized persons. Satisfactory product performance can only result when a manufacturer provides and backs up a quality product and the customer follows through with proper use and proper maintenance of that product. When both the manufacturer and the customer recognizes and assumes his responsibility, satisfactory product performance and customer satisfaction are assured.